

Lawrence Livermore National Laboratory

PREPRO Accomplishments



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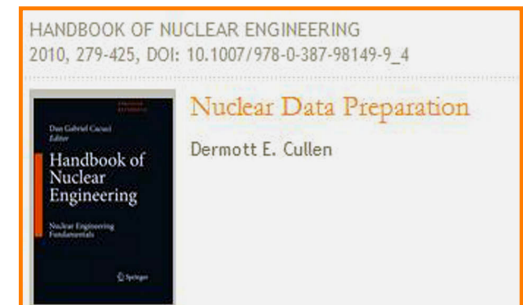
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Latest version of Codes

- **PREPRO2010** = ENDF/B Pre-Processing Codes
 - **Processes ALL of ENDF/B** for use in our transport codes
 - **Runs on ANY computer:** PC, MAC, VAX, LINUX, UNIX
 - Available as **RSICC** Code Package MIS-013:
 - <http://www-rsicc.ornl.gov/codes/mis/mis0/mis-013.html>
 - Also available internationally through **IAEA** FREE on-line:
 - <http://www-nds.iaea.org/ndspub/endf/prepro/>
 - Includes documentation and “Best Input Parameters”
- **Methods used in PREPRO are:**
 - Based on over **40 years** of experience
 - Published in the “**Handbook of Nuclear Engineering**”, (2010), vol. 1, chapter 4, “Nuclear Data Preparation”, pp. 279-425, by Dermott E. Cullen



What's new?

- **Improved optimization (faster)**

- **Conservative coding** that allows highest level of optimization on ALL computers
- **Simplified standard input**: code users love this feature – makes codes easy to use
- Improved based on code **user feedback**
- **Improved compiler diagnostics** on many computers: PC,MAC,VAX,LINUX,UNIX
- A **truly International effort** to prepare codes for use on many computers
- Code users freely contributed their time to this effort (see later acknowledgment)

- **New and Improved codes**

- **SPECTRA** is a new code for 2010, which starting from models and tabulated data, linearizes and tabulates neutron emission spectra (MF=5) in a standard form; it is similar to and is an extension of the LINEAR code that performs a similar function for cross sections (MF=3).
- **RECENT** for 2010 has been extended to handle the general Reich-Moore (LRF=7) resolved resonance formalism. The other resolved formalisms calculate and output total, elastic, capture and fission cross sections. The general Reich-Moore allows many more output channels; RECENT 2010 allows up to 10 output channels, and outputs cross sections are all of these channels. RECENT is currently the only publicly released code to include integrated processing of new Reich-Moore (LRF=7) data.

What's new?

- **New and Improved codes (continued)**

- **SIGMA1** for 2010 has been updated for improved low energy treatment, as well as improved accuracy and consistency throughout.
- **EVALPLOT** and **COMPLIT** are graphics codes that allow users to quickly view nuclear data on their computer screen and/or produce Postscript files for later use, i.e., as in reports. Graphics are absolutely necessary for data testing and comparison, e.g., ENDF/B vs. JENDL.

- **BEST INPUT**

- Parameters are provided for all codes to achieve the recommended precession for integral cross sections of 0.1%, and 0.01% in the thermal, low energy range, and 1% for angular and energy distributions.
- Attempts to **establish a standard of accuracy** for processing data.
- Code users love this feature – makes codes easy to use

Latest version of Data

- **POINT2009** = ENDF/B-VII.0 processed cross-sections
 - All processed solely by the latest PREPRO codes
 - Reconstructed, energy dependent **cross sections**: ~ 10 gigabytes of data
 - **Temperature dependent**: at 14 temperatures
 - 0 (300) to 2100 Kelvin (Reactors)
 - 0.1 eV to 10 keV (Astrophysics)
 - Available as **RSICC** Data Library DLC-239:
 - <http://www-rsicc.ornl.gov/codes/dlc/dlc2/dlc-239.html>
 - Available internationally through **IAEA** FREE on-line:
 - <http://www-nds.iaea.org/point2009/pt2009.htm>
- **Processed data for other data libraries (e.g., JENDL, JEFF, TENDL) using PREPRO is available on-line (from other laboratories)**
 - it has become the **de facto standard** for this use

What's next?

- **POINT2011** = ENDF/B-VII.1 processed cross-sections
 - **Processing** ENDF/B-VII.1 data with PREPRO in progress
 - **Testing**
 - **Release** to IAEA and RSICC
- **Continued user support**

Acknowledgements

- In closing I must acknowledge the contributions of those who prepared the PREPRO 2010 package for release for use on: PC, MAC, VAX, LINUX, UNIX; without their efforts PREPRO 2010 would not be available for use on ALL of these computers:
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